

# FORESTRY SCIENCE IN THE SERVICE OF MAN

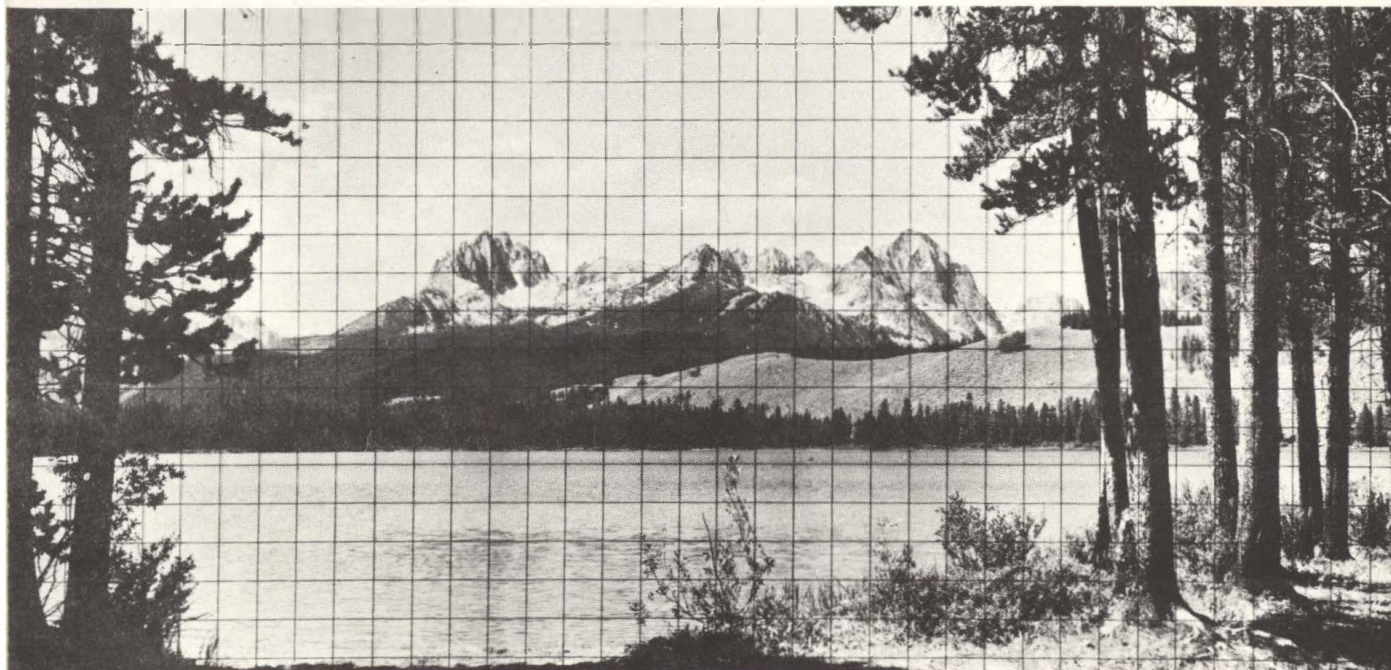


Number 13

## Quantifying Scenic Beauty



FOREST RECREATION



Landscape beauty is more than merely "in the eye of the beholder." Beauty in the outdoors depends on certain inherent attributes of the scenery, as well as on a man's perception.

This principle of scenic beauty is recognized as universal. In other words, whether a man resides on the East Coast or in the West, he will perceive the beauty in his landscaped surroundings the same.

This became apparent in a recent study conducted among New York recreationists by Dr. Elwood L. Shafer, Forest Service recreation researcher, and among Utah campers by James Mietz, a forestry student at Utah State University.

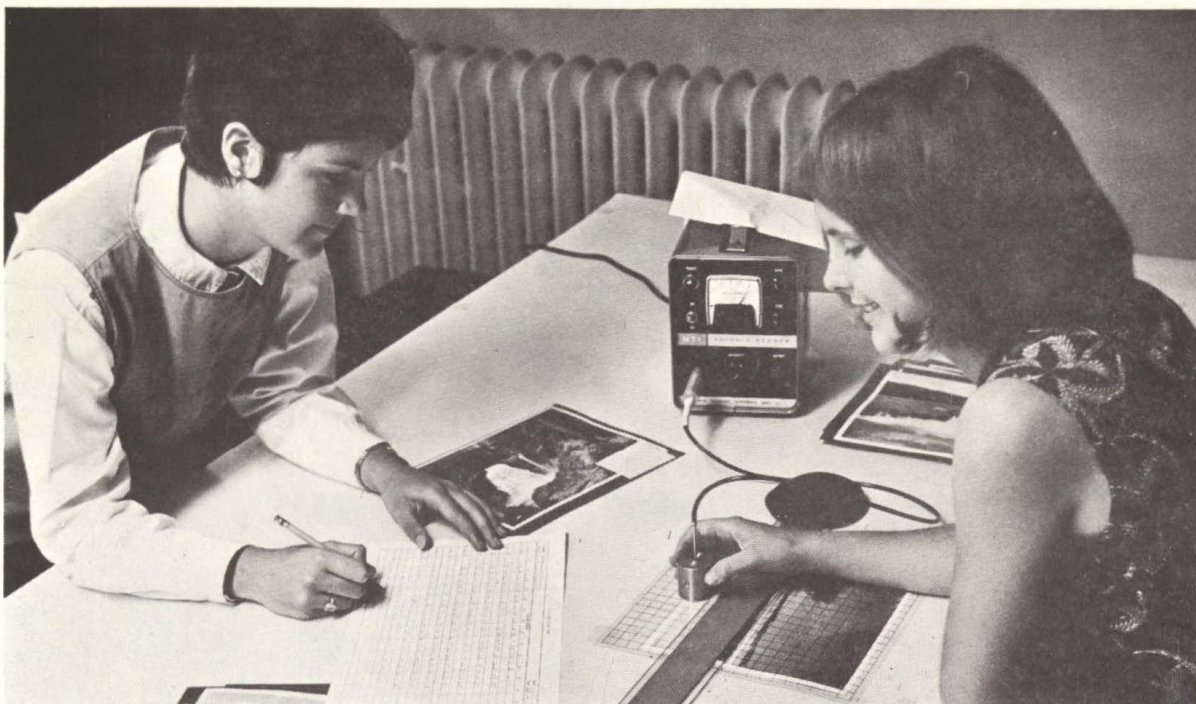
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*Research assistants use a Fotonic Sensor to help evaluate landscape-zone areas and perimeter measurements of photographs used in the study.*

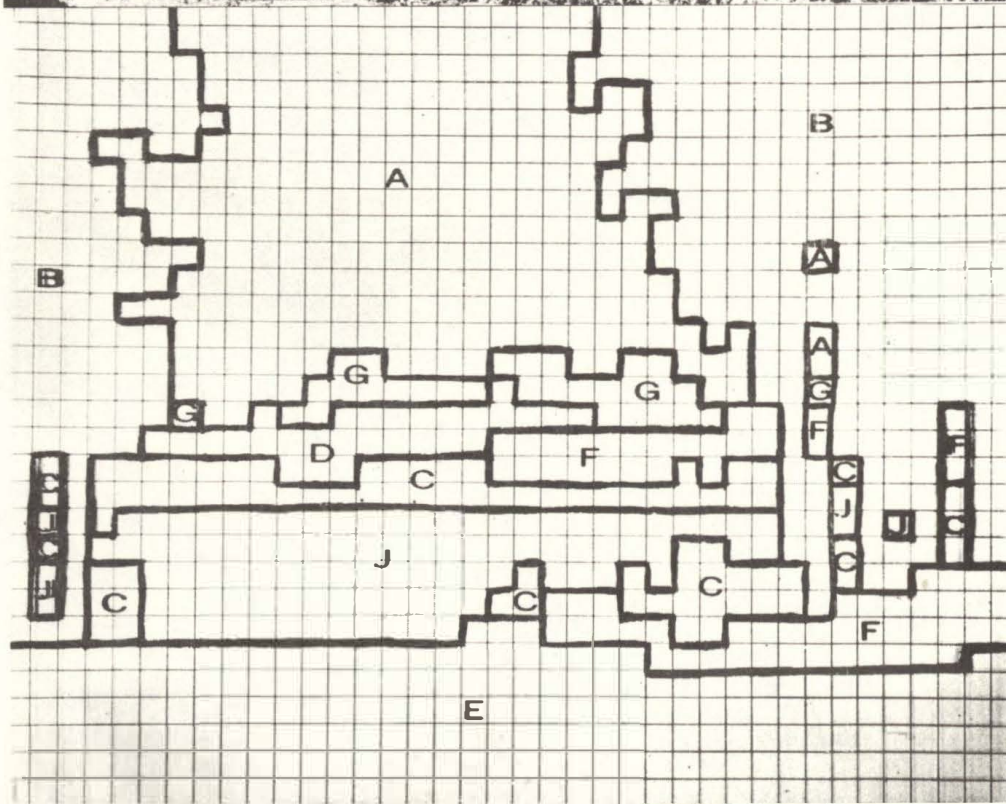
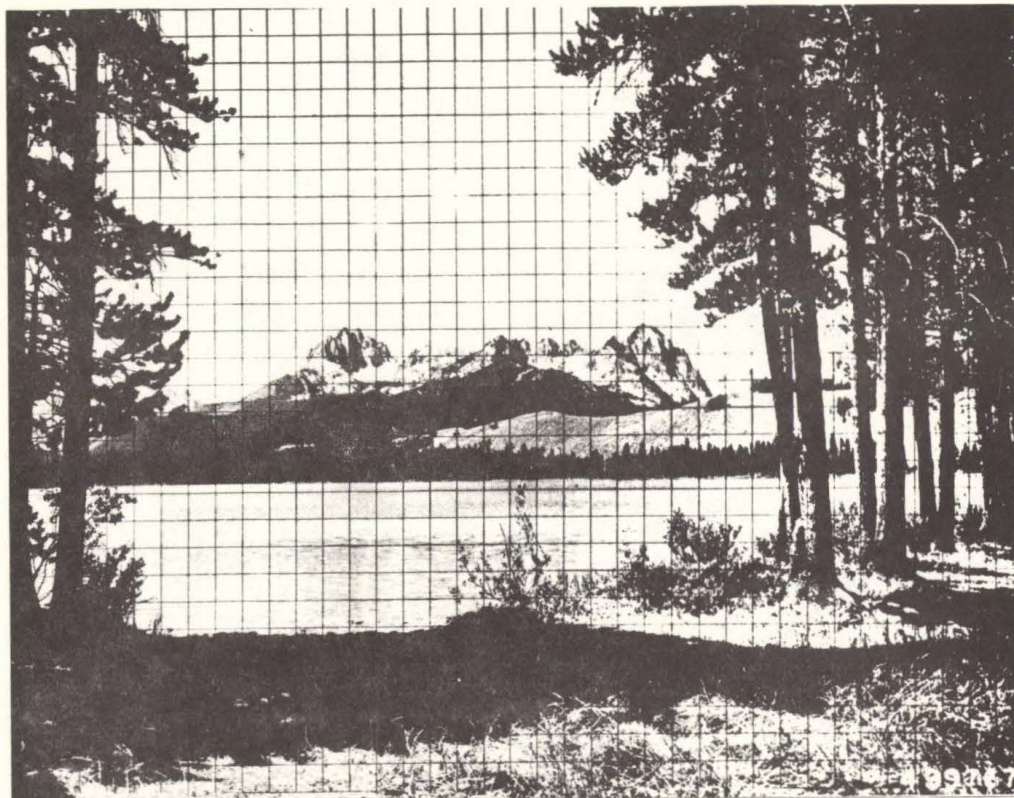
Shafer had previously reported developing a "landscape-preference model" that assigns mathematical values to landscapes depicted in 8x10-inch black-and-white photographs, analyzed into eight distinct zones. The zones are defined according to amount of sky and clouds; immediate trees and shrubs; intermediate trees and shrubs; distant trees and shrubs; detailed characteristics of rocks and vegetative texture; immediate characteristics where outlines of objects are visible; distant objects with areas but no detail; and water. Values for these variables are enumerated by placing a 1/4-inch grid over the photograph, then counting the total number of 1/4-inch squares occurring within the boundary of the particular zone. In developing the model, Shafer used 100 photographs, showing a wide range of landscapes.

In initial testing, the model worked in the East --- people did like what the mathematical prediction said they would like. But a question remained: would people throughout the country demonstrate the same preferences? To find out, the Forest Service undertook a cooperative study with Utah State University.

In the comparative study of East and West, researchers selected 14 photographs from the original 100, and sorted them



After a 1/4-inch plastic grid is laid over a photo (top), the edges of its squares are used to outline the various landscape zones (bottom).



randomly into two sets of seven each. Then researchers randomly chose 50 day-users of two recreation areas on the Wasatch National Forest -- a half-hour's drive from Salt Lake City, Utah. They asked the 50 respondents to rank the seven landscapes shown in the photographs according to preference. The first choice photograph received 1 point; least preferred, 7. Total "observed" scores for each of the 14 photographs were then added.

These observed scores were then compared to a mathematical calculation of predicted scores, according to Shafer's model. When compared, scores provided by the Utah campers and scores predicted by the Shafer model showed astounding agreement for both sets of seven photographs. The question was allayed: people in two different parts of the country demonstrated many of the same preferences. The study was also carried out in Scotland. Results there reinforced previous findings, and pointed out the breadth of Shafer's model.

By knowing that quantitative features in the photograph of a landscape affect its aesthetic appeal, resource managers and regional planners throughout the United States can begin to have a factual basis, in addition to an intuitive one, for decisions about wildland aesthetics. This quantitative model may be used further to give weighted preference values to different natural landscapes.

Additional research will have to concentrate on how well preferences for photographs compare with preferences for those same landscapes when viewed on the ground. Further research will be needed to determine the relationship, if any, between preference value and real estate value of a given landscape. And additional research, using Shafer's methodology, will also be needed to predict preferences for different elements within an environment -- shapes, sizes, and colors of individual trees -- or variations in water -- lakes, streams, waterfalls, and rivers.

Researchers point out that although the model predicts preferences for photos of landscapes -- not for the landscapes themselves -- the procedure seems entirely realistic and practical.

Henceforth, the maxim "beauty is in the eye of the beholder" may have to be tempered by mathematical reasoning.